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Analysis of Urban Landscape Engineering Based on "Sponge City"

Zhengyun Gu

Belarusian State University (Minsk, Republic of Belarus 220071)

Summary:With the rapid economic development,The harmony between the city and nature has become an urgent problem for the city.Use sponge city theory to solve problems in urban garden landscape design,Meet the harmonious development of people's material and cultural living environment and spiritual ecological garden environment.We use the construction principles of sponge city theory design in urban garden landscape design under the concept of sponge city,The principles of garden landscape design in the concept of sponge city,The specific design measures of the garden landscape engineering classification in the sponge concept and the characteristics of the sponge city concept,Use and meaning to do a simple analysis and explanation.

Key words: Sponge city； Urban garden landscape; Urban garden landscape; solution

Introduction

With a series of problems brought about by the rapid economic development of our country,Such as water shortage,Water pollution, floods, droughts, disappearance and shrinkage of wetlands,Problems such as accelerated land salinization have become more serious.People realize that traditional urban gardens can no longer meet the needs of rapidly developing modern urban gardens.Need to be suitable for modern urban garden design theories to guide and build the increasingly problematic urban garden environment,Urban ecological issues, urban water environment and other issues.It is necessary to reasonably collect water resources in cities and alleviate flood disasters.The sponge city theory was put forward and implemented during this special period.Promote the sustainable development of cities. The urban garden landscape in modern cities is an important place for people to relax and entertain.The introduction of sponge city theory can effectively improve the shortcomings of traditional urban gardens.Use advanced and updated urban design theories to build urban environmental space,Improve the urban ecological environment and enrich the living environment of urban people,Can better promote the harmonious and sustainable development of the city.

The sponge city is like a sponge,It has the function of collecting and storing rainwater for a long time,The constructed sponge city can absorb, store, purify, infiltrate, supplement and regulate groundwater, etc.;In the event of drought and water shortage, the stored water resources are released to the cities in need.It has a good elastic function in improving the ecological environment of the city.It is a new thought, new theory, and new concept of modern urban development.Can effectively and sustainably develop the urban living environment.It is also a new theory that respects the ecological harmonious development of natural ecosystems.Is to respect nature,The new urban design concept of harmonious development with nature.The best urban design theory to solve the problems encountered in the process of over-exploitation and destruction of the urban environment to the greatest extent possible.It is also called "low-impact development urban theory" in modern urban design theory.Mainly due to the natural penetration function of the sponge city theory,Natural collection and savings function,Natural evolution function, etc.,It plays an inestimable role in the rapid development of my country's modern economy.

1 Overview of Sponge City and Concept

1.1 Sponge City

Sponge City is based on the harmonious development of natural ecology.To respect nature and conform to the natural ecosystem,Use the natural development, natural penetration, and natural evolution in the natural ecosystem to solve the safety of the water environment in the city,Harmonious development of water resources and water ecological environment.Establish a permanent mechanism to make the development and construction of the city harmonious and natural.Which is like a sponge,Rainwater in the city is removed and stored.It is to collect and store rainwater with sponge city;Drainage pipelines in cities and runoff emissions in cities.Sponge city is to use the green landscape, roads, urban water function system in the city to reasonably store and release water resources.The harmonious development of the urban ecological environment.

1.2 The concept of "sponge city"

Sponge city is a new generation of urban design concept,Is a newly proposed urban stormwater management concept,Mainly to adapt to the urban environment in response to floods,Natural disasters such as drought have "elastic" space,Like a sponge, rainwater can penetrate, store, retain, purify, circulate, and drain,Comprehensive regulation of prevention and control in cities,The urban concept of ecological environment restoration and sustainable development such as rainwater collection and drainage,The main follow is to solve the urban problems arising from my country's national conditions such as "infiltration, retention, storage, purification, utilization, and drainage".The main follow is to solve the urban problems arising from my country's national conditions such as "infiltration, retention, storage, purification, utilization, and drainage".The theory of urban ecological design to protect the environment.Using sponge city design theory,Solve the problems of environmental pollution, ecological destruction, droughts and floods, and ecological evolution in the development of modern urban ecological environment.Realize the natural development, natural penetration and natural evolution of modern urban ecology.Change the increasingly fast-developing ecological environment.Applying modern advanced ecological concept sponge city concept to solve modern urban construction problems.

1.3 The content and construction principles of sponge city design

Sponge cities follow the policy of "infiltration, retention, storage, purification, utilization, and drainage" to improve urban waterlogging.Among them, "infiltration" is the use of infiltration and green space technology,Reduce runoff from the source;"Stagnation" is through the grass ditch,Engineering measures such as detention zone,Reduce rainwater collection speed,Delay the emergence of flood peak runoff,Reduce the drainage intensity of the drainage system,Relieve drainage pressure during heavy rainfall.[]The sponge city has the following principles in its design and construction.Ecological design and construction is one of the most important principles of sponge city,In construction, it is the foundation to maintain the ecological sponge city.Combine the original natural landscape with artificial ecological landscape in the city,So that the water environment problems in the urban area can be solved to the greatest extent during urban droughts and floods;Promote the rational regeneration and utilization of urban water resources and the new construction of urban ecological environment protection.In urban construction,Can make the groundwater and surface water system harmonious,Coordinate and recycle to build the development of the city.Make the urban ecological environment have the functions of "infiltration, retention, accumulation, purification, utilization, and excretion".

2 Analysis of the characteristics of urban garden ecological landscape and sponge city

Urban ecological landscape has multiple ecological service functions and services Effectively support the urban sustainable development needs,Improve the quality of public spaces.It is generally believed that the urban

ecological landscape is dynamic and systematic Coordination Health Sustainability Greenness Features such as versatility Sustainability, ecological economic benefits and harmony are the key features of urban ecological landscape Sustainability is the construction of ecological,Economy,Sustainable and sustainable urban garden landscape.Make the natural landscape, cultural landscape and newly-built artificial creative landscape suitable for the development of the city.In order to make the urban ecological development operate sustainably and reasonably,Meet the needs of people's lives.

The purpose of Sponge City is to adjust the concept of extensive urban construction.Restore urban water ecology and promote the harmonious development of ecology and society.Sponge cities are also called low-impact development, which emphasizes that urban construction reduces the impact on the environment.Reasonable use of landscape space and measures to control storm runof The restoration, construction and improvement of the original ecological landscape system of the city. Both can make the urban ecological environment reach a reasonable toughness.Create a multi-landscape and economical sponge city garden landscape design ecosystem.

3 Principles of urban garden landscape design under the sponge city

3.1 Principles of scientific planning construction

The construction of garden projects under the sponge city is to carry out reasonable urban planning and design under the scientific theory of "sponge city" theory.The planning should be based on the city's environment, economic level, and humanistic geographic information, etc.Use sponge city theory and scientific planning to design a sustainable urban garden landscape project suitable for the city.After the completion of the planning, design and construction, the subsequent maintenance and maintenance of the urban garden project should also be designed and considered together during the planning and construction.

3.2 Principles of construction according to local conditions

Each city has a different geographic location and environment,When we use the sponge city garden landscape design,The designs and solutions are also different.According to the actual situation of the city,Carry out the sponge city design according to local conditions.It is different for water-scarce areas and arid areas.my country's sponge city theory started late,When designing, it will learn from the experience and practices of sponge city design in Europe, America and other countries.This leads to a little dependence on its design experience,Perhaps it will be directly used mechanically.There is no actual investigation to understand the climate, topography, environment, etc. of the local city according to local conditions,Is its design a reasonable urban design,When the design is further improved, resources,Waste of funds,Useless design.We need to learn more about the characteristics of local cities,Combine local water resources,Plant resources,Specific conditions such as ecological resources,For local resources,And the city's original urban gardens were reasonably perfected,And increase more reasonable urban garden design.Make choices based on other international sponge city theories,Improvement, adjustment,Reasonably use the sponge city theory suitable for the city to plan and design the urban garden landscape.If the city is in the south,Or north,Its precipitation is different,Plant growth is different,Greening is different;Then we need to make a reasonable design when designing,In southern areas with a lot of precipitation, the green area should be appropriately increased.Increase the planting of big trees, etc.,Has reached to reduce and quickly slow down the flow of precipitation,This increases the rapid penetration of precipitation into the vegetation,Reduce ground runoff.In cities with little precipitation, other urban landscapes are designed.To increase the city's savings function,Let the city have more flexible space.

3.3 Ecological principles

In economic development,Make the city's ecological environment and economic development a reasonable combination,Form a sustainable ecological urban garden landscape.Urban construction under the concept of sponge

city,Is the effective use of urban water resources,collect,Simultaneously carry out reasonable transformation.Carry out protective ecological sustainable design and restoration of the original water body.Make full use of its original resources for sustainable protection design,Such as increasing the water area,Increase wetland area,Use the surrounding environmental landscape,Realize reasonable self-ecological restoration of the water cycle system in the original ecology;Promote a virtuous circle of the environment.Make the city form a circular ecological city environment and water cycle resource ecological environment.Provide a solid foundation for the sustainable development of the urban economy,Promote the sustainable economic and urban environment development of the city.

3.4 Overall design principles

As an integral part of the urban environment, the urban garden landscape,In the design, a unified planning and design is carried out according to the characteristics of the city and the characteristics of the ecological environment. Pay attention to protecting the original garden environment of the city,The original urban garden landscape and the rebuilt urban garden landscape are harmonized and unified.At the same time, we must make full use of the cultural characteristics and characteristic environmental landscapes in the city.Make urban design uniform,There are also characteristics.Drainage in the design city,When saving the system,Make full use of its properties,In addition to taking into account the basic functions of its drainage and storage systems,It also makes its appearance harmonious with the urban garden landscape,Show the charm of the city together.

3.5 Security Principles

The safety of the city is the basic guarantee for residents'lives.From the urban environment, the application of the sponge city concept,Let the urban landscape design be ecological, beautiful, and Technical design,Caused droughts and floods in cities,Flood disasters are solved through the sponge city concept.Provide protection for the development of the city and the lives of residents.People-oriented in urban garden landscape design,Through a sustainable urban ecosystem,Using advanced scientific construction technology,To make the construction of urban garden projects meet people's needs,It also protects people's lives.in contrast,Did not solve the drought and flood in the city,Rain-related issues such as floods,Will cause other losses such as people's property.

4 Specific measures for urban landscape engineering design

The application of new sponge city theory and specific design and construction,Provide theoretical and specific case support for the implementation of urban landscape engineering,Looking at the specific design and construction from the sponge city garden project,We analyze concrete measures of urban landscape engineering from the following aspects:

4.1 Water seepage garden project

Water seepage engineering is widely used in cities,It can be seen from the unique wooden architecture in China,Such as Beijing now,There are records of seepage engineering and drainage engineering in the Yuan Dynasty of China,Before the concept of "sponge city" was proposed,The use of water in my country has been widely mentioned. There are many classic cases of using water engineering for investigation.Such as Dujiangyan in Sichuan and so on.We use foreign rainwater technical measures,It is suitable for my country's sponge cities.Utilize large areas of green space for water seepage,The seepage ditch beside the road,Seepage wells,gutter Seepage road, etc.To deal with water seepage garden projects.Specifically deal with the following parts:

4.1.1 Water seepage through permeable paving

Specifically, it is through permeable permeable paving such as permeable bricks, grass-embedded bricks, cobblestone paving, crushed stone paving, permeable asphalt paving concrete paving, and permeable cement concrete model paving.

4.1.2 Sinking green space

Use the green space within 200 mm around the road to treat water seepage,It is the seepage or sinking overflow during treatment,In the design and construction process,The height of the top is slightly higher than the green area by 50 ram or more,This is the concealed sunken green space.

4.1.3 Infiltration Pond

Infiltration ponds are depressions used to supplement or store groundwater when rainwater seeps in.Also penetrate the pond,As long as it is used to purify water and reduce flow when the rain is heavy.Set up front ponds, infiltration depression ponds,Pre-installed facilities, such as deep sand ponds (micro ponds),Can slow down the flow rate of water;If it's a snowy city,Measures such as abandoning stream and discharging salt should be taken to prevent deicing agents from harming plants[]

4.1.3 Infiltration pipe (drain)

In the design, infiltration pipes (drains), perforated plastic pipes, etc. that use permeable function are used to set up planting ditch, sedimented sand or bricks, etc., designed pipelines for pre-embedded design processing, called permeable pipes (drains).This tool solves the problem of water seepage,It also solves the problem of greening and beautiful landscape design.

4.2 Water storage and stagnant water garden engineering

Use rainwater storage facilities with stagnant water,Water storage engineering measures such as pits, ponds, hu River, etc.Commonly there are the following:

4.2.1 Wet Pond Project

Wet pond refers to a landscape water body with rainwater regulation and purification functions. Rainwater is also used as its supplementary water source. It is generally composed of water inlets, front ponds, main ponds, overflow and outflow outlets, slope protection and revetment, maintenance channels, etc.[]

4.2.2 Water storage wetland

Water storage wetlands can also be called wetlands.It is mainly used to regulate water storage and stagnant water. It is mainly divided into invisible diving wetland and surface runoff wetland to solve the rainwater problem.

4.2.3 Other categories

With the application of new materials, new technologies, and new technologies in sponge city design, the methods have become diversified.Such as the incision of the curb notch, the landscape water feature, the water seepage garden, and the landscape tree array composed of blister-resistant plants can all solve the problem of water storage and drainage.

4.3 Water purification garden project

4.3.1 Garden engineering blocking facilities

In the design and purification measures of garden retention facilities, use animal infiltration systems such as garden plants, ground cover plants, soil, and microorganisms in low-lying places to purify rainwater flowing into low-lying places.When designing stagnant landscape purification measures, it should be based on the region, environment, etc.,Rough treatment of rainwater runoff,Then refine the treatment.Such as sedimentation of runoff with turbidity,Screening, blocking and other measures,Purify again;Another example is that the purified rainwater on the roof can be screened and blocked by pipeline pre-connection.Purify again, etc.;Road curbs can be pretreated with stone cuts, and water flows into the green space through the curbs.

4.3.2 Zhicao ditch water purification

The ditch purified by the surface of the vegetation is called the planting grass clean water ditch.After collecting, transmitting, and re-discharging runoff By means of transmission and penetration. Purify the water flow.

4.3.3 Purification of gentle slope vegetation zone

Through the vegetation area on the slope,Use vegetation and gentle slopes for rough treatment and

purification,Then through the soil purification on the gentle slope,To achieve the purpose of purifying pollution.When designing gentle slope vegetation, the slope is generally 2%-6% most suitable.The width is 2 meters or more than 2 meters.Because the slope is suitable,So it is widely used.

4.4 Water and drainage garden engineering measures

After the urban ecological environment has the functions of "penetration, retention, accumulation, and purification".The sponge city is already full of water.The subsequent disposal of water sources can be processed and used in the original traditional urban system.Use the sponge city theory to slowly discharge the city's water.It is the "retention and excretion" of the urban ecological environment.According to the location of the city, use appropriate gardening measures to solve the urban drainage problem.

5 The role and significance of urban garden landscape design

In the sponge city design, build suitable water ecological infrastructure,The urban garden landscape is closely related and inseparable from the construction of sponge city.Through the sponge city garden landscape design under the sponge city theory, we can create practical and beautiful water ecological basic biochemical facilities,Realize the scientific, economic, reasonable and efficient use of urban water resources.Maximize the improvement of the ecological environment of urban gardens and landscapes.

Sponge City collects, purifies and utilizes a complete set of urban garden management system for rainwater in urban gardens.To ease the water resources in the city,Make the ecological environment of urban life better.Effectively use urban plants in urban gardens to reduce the occurrence of floods, droughts and other disasters in the city.Reasonable combination of sponge city theory and urban garden landscape,Through the scientific collocation of urban garden plants,Using the combined elements of landscape design,Realize the sustainable development of urban ecological gardens.Improve the city's ecological climate environment and alleviate the ecological problems in the city.It can also better improve the living environment of urban people,Deal with water pollution in the purification city,Improve the air quality of the city's small environment,Ensure that people live in a fresh and beautiful urban environment.Realize the sustainable development of urban economy and ecological economy.

Conclusion

Apply sponge city theory to analyze and explain the garden landscape engineering in the city,Combining the design of urban garden landscape and using the theory of sponge city to reasonably solve the ecological problems in the city. Make the urban garden landscape engineering in the urban ecological environment inseparable and closely integrated with the development of the city,Make the urban ecological environment more suitable, beautiful and more humane.It is also the harmonious and sustainable development of the city's economy and ecological economy.

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